REMARKS

Claim 1-11 and 21-25 are pending in the present application. Reconsideration is respectfully requested for the following reasons.

Claims 1-11 and 21-25 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Depauw et al. (U.S. 5,110,662) in view of GB 2126256 A. The Examiner has restated the previous grounds for rejection and responded to the arguments which we filed September 4, 2002. More specifically, the Examiner has supplemented his previous arguments with the demand that "[a]pplicant must show the references instantly cited cannot exhibit the claimed features in order to overcome the rejection." This appears to be an inappropriate demand. It is sufficient to show that the prior art does not teach or suggest the claimed invention. It is not necessary for Applicant to prove that disclosed prior art devices cannot under any circumstances exhibit the features and characteristics of the claimed invention.

The Examiner states that, "Depauw discloses a conductive transparent layer system with two oxide layers and a silver layer interposed between them on a substrate with a thickness of less than 100nm (abstract and column 9, lines 30-35) where the resistivity can be readily reduced by increasing the thickness of the layers (column 9, line 66 through column 10, line 4). The Examiner's arguments are defective because they rely on the mistaken assumption that one can simultaneously decrease surface resistivity and increase mean Haacke quality factor by increasing the thickness of the layers. Increasing the thickness of the metal layer leads to decreasing the film boundary scattering and therefore the resistivity is reduced. It is known that increasing the thickness of the metal layer leads to reduced transparency of the layer system. Therefore, it is not possible to reduce the resistivity by increasing the metal

layer thickness and simultaneously maintain or improve transparency. Instead, the transparency of the layer system will be reduced by increasing the metal layer thickness.

The Examiner further states, "Although Depauw does not disclose a mean Haacke quality factor, one of ordinary skill in the art can achieve this value utilizing the surface resistivity and transmittance disclosed by the reference." It is not possible to reduce the resistivity by increasing the metal layer thickness and simultaneously maintain or improve transparency. It is Applicants' position that the reason Depauw does not disclose the claimed mean Haacke quality factor, or the exact surface resistivity as applicant, is because the present invention is novel and non-obvious.

Also, the Examiner's reliance on "Applicant's admissions" are irrelevant. The Examiner states, "it is further noted on page 2 of Applicants' specification at lines [sic] 24-27 that 'it is also known that through selective choice of materials and coating parameters, transparent, conductive layer systems can be produced which a resistivity of 2.93 sq, . . .'." Applicants' admission that it is known to select materials, coating parameter, etc. to produce a conductive layer system having a surface resistivity of 2.93_{sq} is not an admission that the claimed conductive transparent layer system is known or obvious (2.93_{sq} is not less than Applicants' claimed value of less than 2.9_{sq}).

The properties of the layer system of the present invention are achievable due to the new production process in which a first oxide layer is deposited on the substrate, a silver layer is deposited on the first oxide layer and a second oxide layer is deposited on the silver layer by means of pulsed DC-sputtering or AC-superimposed DC sputtering. This production method leads to higher carrier densities and higher carrier mobilities in the sputtered oxide films which

in turn improves the optical properties of the oxide layers. The oxide layers are used in an IMI-multilayer to provide the adaptation of optical properties for high transmission in particular in the visual spectral range. The Depauw reference does not teach or suggest how production parameters may be optimized to simultaneously achieve the required surface resistivity of less than 2.9_{sq} and a mean Haacke quality factor greater than 0.085.

Contrary to the opinion of the Examiner, Applicant is convinced that the disclosure of Depauw shows the borderline of an achievable combination of the properties according to the prior art. It was the present invention which achieved for the first time a combination of good electrical and optical properties, i.e. low surface resistivity and good transparency, which is expressed by the mean Haacke quality factor.

Regarding the other cited reference, GB 2126256 A, the Examiner has stated that "[a]lthough the reference does not teach the percentages of the indium, cerium or copper in the multilayer system, weight percentage has a direct affect on the transparency and is therefore optimizible as taught by GB '256." The Examiner has also stated, "[i]t would additionally be obvious to one of ordinary skill in the art to include the wavelength ranges taught by GB '256 in the multilayer system of Depauw because both references have high transmittances and GB '256 further supports this feature by teaching the wavelengths for the high transmittance." These arguments do not meet the fundamental requirements for establishing a prima facie case of obviousness.

In order to establish a prima facie case of obviousness, three basic criteria must be met. Firstly, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or

to combine the teachings. Secondly, there must be some reasonable expectation of success. Thirdly, the prior art reference (or references) must teach or suggest all of the claim limitations. Applicants submit that the Examiner has not established a prima facie case of obviousness for rejecting claims 1-11 and 21-25.

In regard to the first criterion of obviousness, there is no suggestion or motivation either in the references themselves of in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. While it is noted that Applicants' specification states, "it is also known that through selective choice of materials and coating parameters, transparent, conductive layer systems can be produced which have a resistivity of 2.93 SQ . . .", it is not known or taught how to simultaneously achieve a surface resistivity of less than 2.9 and a mean Haacke quality factor (i.e. low surface resistivity and good transparency) greater than 0.085. As previously discussed, it is not possible to reduce the resistivity by increasing the metal layer thickness and simultaneously maintain or improve the transparency. Instead, the transparency of the layer system will be reduced when the metal layer thickness is increased to reduce resistivity. Accordingly, there is no suggestion or motivation either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings.

In regard to the second criterion of obviousness, there is no reasonable expectation that the combination would be successful. The Examiner states,

> [i]t would have been obvious to one of ordinary skill in the art to include the cerium oxide with the indium oxide and the copper with the silver in the layer system of Depauw to sustain the conductivity of the layer system. It would additionally be obvious to one of ordinary skill in the art to include the wavelength range as taught by GB '256 in the multilayered

> system of Depauw because both references have high transmittances and GB '256 further supports this feature by teaching the wavelengths for the high transmittance. Neither reference disclosed the transparency value as disclosed by Applicant. Because the combined references contain the same materials as Applicant, the transparency value would be expected to be the same, absent any evidence to the contrary.

It has not been disclosed in the prior art that a layer system having the claimed properties is achievable. A layer system having a low surface resistivity and simultaneously having a high transparency has been desirable for a long time, however it is not to be expected that one of ordinary skill in the art would simultaneously amend the composition of the oxide layers as well as the thickness of the metal layer in order to achieve low surface resistivity and high transparency. Instead, one of ordinary skill in the art would avoid changing more than one parameter at the same time. Changing more than one parameter at the same time could lead to serious deficiencies. Accordingly, there is no reasonable expectation that the combination would be successful.

In regard to the third criterion of obviousness, the prior art references do not teach or suggest all of the claim limitations. Neither of these references teach or suggest a conductive transparent layer system having the required surface resistivity and mean Haacke quality factor. The Examiner has admitted that Depauw does not disclose any mean Haacke quality factor and does not explicitly disclose the exact surface resistivity as Applicant. Further, it appears that the combination of Depauw et al. in view of the GB '256 reference is not any closer to teaching or suggesting the claimed transparent layer system having the required surface resistivity and mean Haacke quality factor than the previously applied references. In particular, the references do not teach or suggest adjusting a combination of parameters to

achieve the required characteristics of the claimed conductive transparent layer system. In fact, the examples of the Depauw reference all have a mean Haacke quality factor well below 0.085^{-1} and a surface resistivity above 2.9_{sq}. While the Depauw reference teaches that the surface resistivity may be reduced by increasing the thickness of the silver layer, this would be expected to reduce the optical transmittance and therefore the mean Haacke quality factor. Further, the Depauw reference does not teach or suggest how production parameters may be optimized to simultaneously achieve the required resistivity and mean Haacke quality factor. For these reasons, the rejection is improper and should be withdrawn.

The Examiner has not shown that one of ordinary skill in the art has any motivation to combine these references or would arrive at the present invention by combining these references. Since it has not been disclosed in the prior art that a layer system having the claimed properties is achievable, one of ordinary skill in the art would not expect a combination of the prior art references to lead to the claimed invention. While the objective of obtaining a low surface resistivity and a high transparency is well known, the prior art does not teach or suggest modifying both the composition and the thickness of the metal layer in order to achieve low surface resistivity and high transparency. Instead, one of ordinary skill would avoid changing more than one parameter simultaneously because doing so could lead to serious deficiencies in the properties.

It is not by following the teachings and suggestions of the prior art that those having ordinary skill in the art would achieve the claimed combination of performance factors. Instead, it is only by selectively modifying the prior art teachings guided by Applicant's own disclosure that one having ordinary skill in the art could achieve the claimed invention. More

specifically, the prior art does not disclose Applicant's process techniques for simultaneously achieving the required resistivity and mean Haacke quality factor.

All pending claims 1-11 and 21-25 are believed to be in condition for allowance, and a Notice of Allowability is therefore earnestly solicited.

Respectfully submitted,

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By: Price, Heneveld, Cooper, DeWitt & Litton

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Date

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